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ATIS COAST SYNC



Lee Cosart/Michael Mayer
COAST-SYNC Chair & Vice-Chair
WSTS 2013

Technical Reports:

Synchronization of Packet Networks

Metrics Characterizing Packet-Based Network Synchronization

Synchronization Standard:

*Physical Interconnection for Intra-Office Ethernet-based Timing
Distribution*

Ongoing activity:

Time profile discussions coordination US/ITU

Intra-office time/frequency distribution

GPS jamming/spoofing

Prior Name: OPTXS-SYNC (before April 2010)

Originally: ANSI T1X1.3 (before 2005)

ATIS American National Standards

- ATIS-0900101.2006 (formerly T1.101-1999), Synchronization Interface Standard
- T1.105.03-2003 (R2008), Synchronous Optical Network (SONET) - Jitter and Wander at Network and Equipment Interfaces
- T1.105.09-1996 (R2008), Synchronous Optical Network (SONET) - Network Timing and Synchronization
- ATIS-0900002.2009, Synchronization Standard – Physical Interconnection for Intra-Office Ethernet-based Timing Distribution

ATIS Technical Reports

- T1.TR.06-1990, Slave Stratum Clock Performance Measurement Guidelines
- T1.TR.08-1991, Jitter Measurement Methodology
- T1.TR.09-1991, Maximum Skew One-Tenth Maximum (MSTM) Model for Mode-Partition Noise (MPN)
- T1.TR.17-1993, The Effects of SONET on Payload Output Jitter
- T1.TR.33-1994, Synchronization Network Management Using Synchronization Status Messages
- T1.TR.52-1996, Value and Interpretation of Digital Pulse Masks and Eye Patterns
- T1.TR.81-2003, Synchronization Network Architecture
- ATIS-0900001 (2008), Synchronization and Packet Networks
- ATIS-0900003 (2011), Metrics Characterizing Packet-Based Network Synchronization

Synchronization of Packet Networks, Technical Report, ATIS–0900001 (2008)

- Origins trace back to 1995/1996 in T1X1.3 when impact of ATM cell-delay-variation was discussed (c.f. T1X1.3/96-086)
- Very broad scope including timing distribution, mechanisms for timing over packet, circuit emulation, different packet transport technologies (IP, ATM, MPLS, Ethernet, xDSL, PON)

Physical Interconnection for Intra-Office Ethernet-based Timing Distribution, Synchronization Standard, ATIS–0900002.2009 (April 2010)

- Content addresses the “physical layer”
 - Covers “copper” (electrical) as well as “fiber” (optical) transmission
 - Includes 100Mbit/s as well as 1000Mbit/s Ethernet formats
 - Connectorization

Metrics Characterizing Packet-Based Network Synchronization, Technical Report, ATIS–0900003 (May 2011)

- Started as Issue SYNC 010 April 2010, completed and consented October 2010
- Related to material in G.8260 Appendix 1
- Discusses packet frequency transport metrics
 - Defines packet time sequence, PDV measurement
 - Pre-processed and integrated packet selection
 - Includes such metrics as minTDEV, MATIE, and MAFE

New Technical Report

- *Technical Report on Intra-Office Synchronization Architecture (late 2013)*
 - Description of methods for delivering a timing (time/frequency) reference from TSG (BITS) to Network Element in an intra-office environment with emphasis on performance aspects
 - Addresses both time and frequency distribution
 - Covers PTP (IEEE 1588), NTP, Synchronous Ethernet, DOCSIS Timing Interface (DTI)

Standards updates

- ATIS-0900101 (2006) *Synchronization Interface Standard*
- ATIS-0900105.03 (2008) *Synchronous Optical Network (SONET) – Jitter at Network Interfaces*
- ATIS-0900105.09 (2008) *Synchronous Optical Network (SONET) – Network Element Timing*

GPS backup

- GPS vulnerability: jamming and spoofing
- COAST-SYNC/ATIS activities related to GPS backup:
 - Correspondence with DHS on backup to GPS for precise time and frequency distribution
 - Letter to FCC reviewing LightSquared GPS interference (LightSquared filed for bankruptcy May 2012)
 - Light Reading Conference on GPS Interference Nov 2012 including “GPS Security Vulnerabilities In The Mobile Networks and Alternative Synchronization Solutions” by James Armstrong (ATIS Board Member, CTO Symmetricom)
 - DHS GPS vulnerability meeting Feb 2013
 - ATIS “GPS vulnerability and implications for telecom” webinar with Todd Humphreys (UT Austin), Martin Nuss (CTO Vitesse), and James Armstrong (CTO Symmetricom) Feb 2013
 - NIST-DHS-USNO experiment to transfer time through a public network (future)

Thank You

Lee Cosart

ATIS COAST-SYNC Chair

lcosart@symmetricom.com

Phone: +1-408-428-6950

Michael Mayer

ATIS COAST-SYNC Vice-Chair

mgmayer@gmail.com



Symmetricom, Inc.
2300 Orchard Parkway
San Jose, CA 95131-1017
Tel: +1 408-428-7907
Fax: +1 408-428-6960

www.symmetricom.com